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Feminism and science

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FEMINISM AND SCIENCE

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ABSTRACT

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This thesis addresses issues of feminism and science. First, it examines several different methodologies that sciences can adopt. In addition, the oppression and domination of women throughout their lives and how it relates to science is discussed. Second, two theories of scientific knowledge that have emerged from feminist research in the sciences—feminist empiricism and feminist standpoint epistemology—are examined. Finally, the issue of how patriarchal domination and epistemic discrimination play a significant role in defining knowledge and determining the knowledge of others will be addressed.

Research on this subject reveals that the oppression and domination of women throughout their lives relates to science in many ways. The methods by which females and males are nurtured and socialized result in the establishment of gender-specific roles. Overcoming one's reliance on distinctively masculine lives will improve women's lives and society as a whole.

In *The Science Question in Feminism*, Sandra Harding begins by asking "'What is to be done about the situation of women in science?' . . . Is it possible to use for emancipatory ends sciences that are apparently so intimately involved in Western, bourgeois, and masculine projects?" [1] She holds the following view:

> [T]he epistemologies, metaphysics, ethics, and politics of the dominant forms of science are androcentric and mutually supportive; that despite the deeply ingrained Western cultural belief in science's intrinsic progressiveness, science today serves primarily regressive social tendencies; and that the social structure of science, many of its applications and technologies, its modes of defining research problems and designing experiments, its ways of constructing and conferring meanings are not only sexist but also racist, classist, and culturally coercive. In their analyses of how gender symbolism, the social division of labor by gender, and the construction of individual gender identity have affected the history and philosophy of science, feminist thinkers have challenged the intellectual and social orders at their very foundations. (Science Question p. 9)

Harding's goal is to identify and examine the conflicts between feminism and science while, at the same time, attempt to construct "emancipatory meanings and practices" [2] among feminists and current practitioners of science. Her belief is that " . . . feminist science critiques can be shown to have implications at least as revolutionary for modern Western cultural self-images as feminist critiques in the humanities and social sciences have had." [3] In order to construct emancipatory meanings and practices, as well as to change cultural meanings in theorizing about social life, Harding believes it would be inappropriate to cease the process of systematic inquiry itself. Rather, she believes that androcentrism, which perpetuates distinctively masculine projects in the sciences, [4] must end.

In this thesis, I shall elaborate upon several main issues. First, I will examine Harding's views of a number of different methodologies that sciences can adopt. In addition, I will discuss the oppression and domination of women throughout their lives and how it relates to science. Second, two theories of scientific knowledge that have emerged from feminist research in the sciences—feminist empiricism and feminist

standpoint epistemology—will be examined. Finally, the issue of how patriarchal domination and epistemic discrimination play a significant role in defining knowledge and determining the knowledge of others will be addressed.

Throughout her discussion of feminism and science, Harding discusses a number of different methodologies that sciences can adopt: science-as-usual, bad science, and feminist science. It will be beneficial to survey each science in further detail. Beginning with science-as-usual, Harding argues that such science incorporates " . . . the whole scientific enterprise, its purposes, practices, and functions." [5] For Harding, science-as-usual should examine the conventional context of discovery—the selection and definition of problems for scientific inquiry that " . . . [are] supposed to be advanced exclusively by rigorous justification procedures." [6] However, she believes that science-as-usual fails to question and challenge the ethics, goals, and functions of science. Science-as-usual also fails to incorporate gender, race, and class projects of those individuals outside the dominant culture. [7] These failures contribute to the presence of masculine bias in scientific methodologies. Harding questions why women should be encouraged to become scientists and thus part of the problem if science-as-usual remains the same. She believes that simply adding women " . . . to the social structure of a science that appears to be so thoroughly integrated with the misogynist, racist, and bourgeois aspects of the larger society" [8] will make no difference to women's situations. Once women are added to this social structure, they may simply serve to strengthen those class and race divisions that already exist between women. Harding says:

> Women at the top of race and class hierarchies who succeed in science tend not to criticize or work against those forms of domination that oppress their sisters in other classes and races; they can easily become mere tokens whose individual achievement has little or no positive effect on the situation of the women who are not so favored. (Whose Science p. 67)

In fact, Harding claims that this situation may prove detrimental to some women, for

once the token number of women is hired to satisfy affirmative action laws, other highly qualified and talented women will be passed over—deemed unnecessary as quotas have already been met. [9] Yet, she points out that " . . . women scientists can bring certain benefits to the growth of knowledge if they can find ways to use their experience as women, informed by feminist theorizing, to create a critical perspective on the dominant conceptual schemes and how they shape scientific research and practice." [10] The foundation of science-as-usual, as it exists today, will gradually diminish if and when women become able to achieve positions of authority in both science and society. Clearly, these criticisms of the ethics, agendas, consequences, and status of science-as-usual call for the need for a better science. Harding proposes a less partial, less distorted science that describes and explains how science can incorporate the experiences and insights of all genders, races, and cultures in the natural and social worlds. Before addressing this better science, let me elaborate upon bad science.

In contrast to science-as-usual, which examines the context of discovery—the selection and definition of problems for scientific inquiry, bad science examines the context of justification—the testing of hypotheses and interpretation of evidence that advance knowledge. [11] According to Harding, bad science assumes " . . . that men's problems are everyone's problems, thereby leaving unexplained many things that women find problematic, and to assume that men's explanations of what they find problematic are undistorted by their gender needs and desires." [12] In other words, empirical data based on all human beings' experiences are not taken into consideration, but only data based on the experiences of white, western males. Bad science fails to incorporate women's responses to moral dilemmas because women's responses do not fit into the categories that have been designed to receive only men's responses. Furthermore, Harding believes research designs that legitimate having men talking to men about

women's beliefs, values, and behaviors distort reality. [13] For Harding, making hasty generalizations about all human beings based solely on data based on the experiences of men violates rules of scientific method and theory because they fail to incorporate data about women as well. Faulty research, conducted under the premises of bad science, tends to generate scientific data that support the dominant status of white, western males over that of white women, as well as people of color. [14] She emphasizes that both the selection and definition of problems will always be directed and guided by dominant groups in a culture. That is, androcentrism creates and perpetuates bad science. Harding believes that the scientific method should be strong enough to eliminate any social biases from scientific hypotheses, research, evidence-gathering, and results. In order to quell androcentrism, women must be given the same opportunities as men " . . . for education, degrees, lab appointments, publication, teaching positions, membership in professional societies, awards, and the other benefits that participation in science can provide." [15] When given these opportunities, women will be able to demonstrate their ability to practice science just as well as men. Harding claims that the sole issue in science is not whether there are too few women, but who is directing scientific agendas, and why so few of them are women. Simply because women are in science does not mean it is necessary that women become "one of the guys" in order to uphold their positions within the scientific community.

Based on Harding's views of science-as-usual and bad science, it is clear that women have long remained outside the scope of science. In order for Harding to achieve emancipatory meanings and practices in science, and to overcome androcentrism, it is important to delve into where specific gender-role definitions, oppression, and domination begin and why they persist.

To ameliorate the situation of women in science, the following issues need to be

addressed. The first is to examine the path that women have traditionally followed and to determine how to direct women on a course destined for success in the sciences. The second is to examine the science—its members, agendas, and applications—and perhaps modify the science into something that women want to study and practice. To begin with, let me examine the path that women have traditionally followed.

In *Myths Of Gender: Biological Theories About Women And Men*, Anne Fausto-Sterling examines the issue of biological versus social determinism or, as it is sometimes called, nature versus nurture. [16] This issue questions whether or not gender differences should be explained through brain structure and genetic makeup, or through cultural influences and socialization. She notes that a myriad of theories exist as to why there are more male than female geniuses, why males score higher on high school standardized math tests than females, and why males excel in the classroom and hence in the job market than females. [17] One biological claim made is that the female and male brain structures and genetic makeup differ, and that in virtue of this difference, each gender develops different verbal and mathematical abilities. The theory of hemispheric specialization details the differences between the left and right brain hemispheres. The left hemisphere appears to direct analysis, computation, and sequential tasks while the right hemisphere appears specialized in artistic abilities, and emotional and nonanalytic approaches to issues. The brains of human beings are not hemispherically symmetrical. This can be demonstrated by one's hand or foot preference, and by how one uses one side of the body more skillfully than the other. This biological claim presupposes that hemispheric differences in the brain cause behavioral differences between females and males. In addition, different prenatal and pubertal hormonal environments exist between the sexes, also contributing to differences in brain structure and function. [18] These differences, in turn, lead to cognitive ability distinctions among females and males. On

this theory, males develop greater visual-spatial acumen which helps make them more adroit than females with maps, mazes, and mathematics. [19] However, Fausto-Sterling believes that research based on explaining gender differences through biology is inconclusive and overly simplistic. She believes that there is evidence that visual-spatial skills are, in part, learned skills. She cites the following example:

> [C]onsider the fact that first-grade boys do somewhat better than do first-grade girls on embedded figures and blocks tests if neither has seen such tests before. Allowed a bit of practice, however, the girls improve enough to catch up, although the boys' scores do not change much. Researchers conclude from such studies that first-grade boys have already honed these skills so that additional practice does not lead to improved performance. Why boys might be more practiced is anyone's guess but since young boys and girls have quite different play experiences, one can at least construct a plausible hypothesis. Traditional male games such as model construction, block building, and playing catch might play a key role in developing visual-spatial skills, yet the relationship between play activities and the acquisition of spatial abilities has received scant attention from the research community. (Fausto-Sterling p. 34)

Ostensibly, young females begin to speak earlier than do young males and so develop better verbal and communication skills during their lives. Fausto-Sterling dismisses the notion that these assertions can be biologically based because of their lack of substantiated proof in scientific literature. Scientific procedures and statistical significance can be, and are, manipulated by researchers—consciously or unconsciously—when testing a hypothesis. [20] The results can be meaningful or meaningless. Thus, she believes that claims of differing skills between females and males are utilized to perpetuate differences between females and males in order to avoid facing up to real problems and issues that exist in the educational system. These differences have also provided a rational for discrimination against women in the workplace. [21] Fausto-Sterling believes it is more important to base educational and counseling decisions relating to verbal ability on the actual analysis of a female's or male's skills, rather than on simple observation of a child's gender. [22] In fact, Fausto-

Sterling believes that "[since] the curricula of primary and secondary schools have become less sex-segregated with the development of equal athletic facilities and both boys and girls taking shop, typing, mechanical drawing, and home economics, . . . there is no reason to believe that sex-related differences will remain constant and every reason to assume that studies done in 1955 and in 1985 will have different outcomes." [23]

In summing up those factors that influence a child's development of spatial skills, Fausto-Sterling says:

> Early child-parent interactions may well be involved. Plenty of studies show that parents treat boys and girls differently. Mothers are more likely to repeat or imitate vocalizations from a girl baby than from a boy baby, and they are also more likely to try to distract a male infant by dangling some object in front of him. Individual personality differences also influence parent-child interactions. Preschool children have different play habits. Boys usually explore more and stay away from their parents for longer periods of time than do girls, and certainly differences in games, toys, and amount of exploration could account in part for differences in the development of spatial skills. Girls often wear physically restrictive clothing, such as frilly, starched dresses and patent leather shoes, which contributes to their more physically limited environment. As children grow older they also learn more about sex-appropriate behavior. Pressures to conform are especially strong during the teenage years, when small sex-related differences in spatial skills first consistently appear. Visual-spatial skill-dependent activities ranging from shop and mechanical drawing to mathematics and engineering are also stereotyped male strongholds, daunting to even the most talented girls. Thus the many complex components of sex-role stereotyping may be superimposed upon and may interact with earlier developmental events. In short, there is not any one cause of sex-related differences in visual-spatial skills. There are many causes. Only future research will tell which are truly significant. (Fausto-Sterling p. 36)

Stereotyping among females and males that seeks to predetermine a female's skills versus a male's skills diverts attention away from the core issue at hand. Although gender stereotypes are slowly beginning to diminish, the frequency with which we see the color blue, and sports and military paraphernalia relegated to males, and the color pink, and household and beauty paraphernalia relegated to females, is astounding. Stereotyping must cease in order for young females and young males not to be typecast. Rather, young

females and young males should be encouraged to participate in those activities which interest them. The choice or preference, regardless of that individual's gender, should primarily be left up to the individual.

It has not only been scientific institutions that have discouraged women from pursuing science, but also the educational systems. At the onset of the socialization process, most educational systems steer young females away from the sciences because science is perceived as a man's field. [24] Fausto-Sterling cites the following example:

> [T]he educational system does not foster a love of science in girls. Most teachers of kindergarten through eighth grade are women, and many are not well versed in science. They do not serve as effective role models for young girls interested in science. In addition, many stereotypes—of scientists as nerds, as mad and as male—persist . . . . Girls are told in myriad ways that they are not as good at mathematics as boys are. This social myth has no foundation in reality. Researchers have found that girls often do as well as boys in math in elementary and junior high school. Yet girls hear quite early that higher math is for boys . . . Girls are not taught to put themselves forward to get into that group of precocious math kids. You have to push yourself forward, but girls are not encouraged to do that. (Holloway pp. 98-99)

Fausto-Sterling acknowledges that research exists which demonstrates that females enroll in fewer mathematics courses in high school than do males. There are several reasons why this phenomenon can occur. One reason is that females have been discouraged by parents and the educational system in pursuing mathematics, in part because of the continued stereotyping of mathematics as being a man's field. Another reason is that females can be genuinely less adept at mathematics, regardless of how much education and training they receive. Fausto-Sterling found that most educational researchers agreed that young females and young males are equally good at math until the seventh grade. The National Science Foundation has discovered that the " . . . differences in science scores between girls and boys on some standardized tests had decreased." [25] Studies conducted prior to 1974 claimed that significant sex-related differences in mathematics achievement failed to use well-matched populations. Rather, these studies compared

young males who had taken a large number of courses, for example, three to four, versus young females who had taken only one or two math courses. Later, however, when these studies attempted to control both the number of math courses and the number of related courses in areas such as mechanical drawing and drafting, small sex-related differences favoring young males were sometimes found. Inconsistent results were obtained in studies utilizing large unselected samples. [26] Fausto-Sterling emphasizes the role of social factors being taken into consideration in some of the studies for which sex-related differences in math were found among students with the same number of formal math courses. She believes that differences in spatial visualization play only a minor role. However, she notes the following:

> [T]he perceived importance of mathematics for future studies (girls less often thought it important), the perception of math as a male field (more male engineers and math professors), active discouragement of girls by teachers and parents (girls more often received negative feedback than boys), all taken together went a long way toward accounting for the small, occasional differences found in mathematics achievement between boys and girls who have taken the same number of math courses. (Fausto-Sterling pp. 55-56)

Clearly, stereotyping and socialization greatly contribute as to why there are fewer women in science. Parents and society typically encourage young males to participate in abstract thought, have physical interaction with the environment, and to pursue control. These attributes typically encourage males to pursue science, math, and engineering. Often, the result is male dominance. Conversely, young females are encouraged to develop more womanly pursuits such as relational thought, and personal or caring service to others. These attributes typically encourage women to pursue teaching, mothering, and service or care activities. Often, the result is female subordination. [27] Even as women begin to take an active role in areas beyond mothering or nurturing, they are often discouraged from and derided when participating in or discussing issues about fields in which they are not experts. Ironically, women could never have been considered experts

in those fields from which they were discouraged because patriarchy excluded women from virtually all areas of education, including scientific education. It was, therefore, impossible for women to participate in scientific activities. [28] Parents, educational systems, and scientific institutions need to become more aware of how their methods of nurturing, teaching, and encouragement can no longer be different for young females and young males. Equal opportunities need to exist for both genders. Requirements and quotas have already been established in order to undo past inequities in discriminating against minorities. Ultimately, perhaps, it may prove necessary that as these young females and young males mature into adults, rigid standards may need to be continued or established.

Now, after reviewing how changing the path that women have traditionally followed can help ameliorate the situation of women in science, I will begin to examine how changing the science—its members, agendas, and applications—can encourage women to want to study and practice science. To begin with, women continue to be a small minority in the scientific community. For example, in "A Lab Of Her Own," Marguerite Holloway discusses the decades of struggle that women have endured in trying to enter into and advance within the scientific field, a field overwhelmed with males. It is through deterrence, exclusion, and attrition that the number of women able to enter into and advance within the scientific field is low. In explaining some of these circumstances, Holloway cites the following:

> Regardless of their [specialty of science], women scientists typically earn salaries that are about 25 percent lower than those paid to men in the same positions, they are twice as likely to be unemployed and they are rarely promoted to high positions (in 1989, 7 percent of tenured faculty in the sciences were female). Women report less encouragement from their peers and supervisors, less mentoring and help with professional advancement as well as greater isolation and harassment. (Holloway p. 96)

In addition, women who represent the minority in the sciences are not typically made to

feel at home in the scientific community. For example, the National Academy of Sciences currently has only 70 female members out of 1750 living scientists. [29] Betty M. Vetter, executive director of the Commission on Professionals in Science and Technology, believes "[t]here is still resentment between the old guard and women [and that it] will change when [the old guard] dies." [30] Women have also been denied access to traditional scientific training. According to Holloway, many educational and scientific institutions seek to maintain a status quo with a male dominated environment. This prevents women from entering or even participating in scientific discussions. In addition, studies indicate that when men organized meetings, the majority of attendees was male, regardless of the percentage of women in that particular field. [31] Susan Gerbi, president of the American Society for Cell Biology, notes that "[o]nly 24 percent of the speakers at past meetings of . . . which is roughly 50 percent female, were women, even when the conferences were organized by women . . . When men organized the conferences, less than 10 percent were female." [32] This does not suggest that the exclusion of women in these previous examples is intentional. However, whether or not women are intentionally excluded is not the focus of the issue. The focus of the issue is that men continue to dominate science at the expense of women.

Another example where discrimination occurs against women in the sciences is the editorial boards at many scientific publications. According to Holloway, not only are the majority of staff members male, but the majority of papers are written by males. She does not presume to speculate that if the majority of staff members were female, or if the female-male balance of staff members was more equitable, that it would necessarily follow that more female-authored papers would be accepted. As an example, Holloway notes the following:

> A study conducted in the early 1980's asked 180 men and 180 women to rate

> comparable papers. One third of the papers [were] supposedly written by John T. McKay, another third by Joan T. McKay, and the final series by J. T. McKay. Both the women and the men gave the "John T." papers the highest score. Whatever the cause . . . women tend to publish 30 percent fewer papers than do their male colleagues in the first 12 or so years of their careers. The disparity increases over time. (Holloway p. 98)

Discrimination against women in the sciences also exists in undergraduate and graduate programs at colleges and universities. Holloway says that sometimes as many as half of the first-year female college students are interested in science and engineering. Initially, it appears that the number of women and men in introductory science courses are comparable. However, at some point during their academic careers, the rate of attrition for women exceeds men's. Women are neither nurtured nor encouraged towards pursuing the sciences. Women are also not perceived as having the same skills as men who succeed in science. To ameliorate this situation, some colleges and universities have established mentoring programs which allow women to gain experience in laboratories, meet actual scientists, and observe what is happening in science first-hand. According to Mary Pavone, director of the Women in Science project at Dartmouth College, women find that scientists " . . . are very regular people who make mistakes and have to do things over again." [33] Holloway also notes that at the doctoral level, women are approximately fifteen percent less likely to complete their degrees. [34] According to C. Megan Urry, chief of the research support branch at the National Aeronautics and Space Administration's Space Telescope Science Institute, "[you] have to have someone on the faculty who wants you . . . science is ultimately a guild, in which a master passes on skills . . . to apprentices. For reasons of ancient tradition and contemporary culture, those apprentices are predominantly male." [35]

Holloway believes that another way to make science more appealing to women is to ensure that the agendas and applications of science begin with a problem or question whose solution results in some social relevance, useful application, or benefit to society.

Similar attitudes hold true in young females and young males test scores, according to the National Science Foundation. They found that young females perform better than young males in mathematical tests when the math problems posed to young females contained some social implication. In addition, when testing verbal ability, young males improved over young females if the material young males read in the tests described science or sports. [36] Furthermore, females prefer that those efforts made towards a response or solution to a problem be a collaboration of efforts among individuals rather than a competition. [37]

Harding draws attention to numerous women who have made important contributions to the field of science, but who were virtually ignored and devalued because they were excluded from participating and contributing to the writings of the androcentric mainstream. [38] Harding believes that even though women collected pertinent data leading to significant discoveries by male scientists, and provided training in the sciences that paved the way for future achievements of male scientists, many obstacles that exist for women in science begin at a very young age. The contributions that women made to the field of science included the organizing and running of salons that enabled male scientists to procure patrons in funding laboratories. In addition, women collected pertinent data in the fields of biology, astronomy, and botany. This data eventually led to many discoveries by male scientists. Other women's roles in advancing the sciences have included computer programmers, data analysts, and lab technicians. Moreover, women teachers have provided significant training in the sciences that paved the way for the future success and achievements of male scientists. If women had not performed these duties demanded of them by male scientists, significant achievements by men in the sciences would not have been possible.

Is it likely that after changing the methods by which young females are nurtured

and socialized, and altering the members, agendas, and applications of science, that women will have a higher propensity towards pursuing science? The answer, I believe, is that women will want to pursue science, though they will still encounter a dominant culture. This dominant culture may abrogate the changes and progress parents, educational systems, scientific institutions, and women have strived to attain, as previously discussed. In what follows, I will examine how patriarchy and oppression can have a negative effect upon women and their pursuit of science.

In *Femininity And Domination: Studies In The Phenomenology Of Oppression*, Sandra Lee Bartky defines oppression as " . . . to lie heavy on, to weigh down, to exercise harsh dominion over [another individual]." [39] She says that:

> Those who claim that any woman can reprogram her consciousness if only she is sufficiently determined hold a shallow view of the nature of patriarchal oppression. Anything done can be undone, it is implied; nothing has been permanently damaged, nothing irretrievably lost. But this is tragically false. One of the evils of a system of oppression is that it may damage people in ways that cannot always be undone. Patriarchy invades the intimate recesses of personality where it may maim and cripple the spirit forever. No political movement, even a movement with a highly developed analysis of sexual oppression, can promise an end to sexual alienation or a cure for sexual dysfunction. Many human beings . . . may have to live with a degree of psychic damage that can never be fully healed. (Bartky p. 58)

Bartky believes that patriarchy, or the dominant male institution which has inflicted human damage upon women, plays a significant and harmful role in the oppression of women, not only psychologically, but racially, economically, and politically. Following Frantz Fanon in *Black Skins, White Masks*, Bartky identifies three categories of psychological oppression that illustrate how inferiority is instilled in the oppressed: stereotyping, sexual objectification, and cultural domination. She discusses how each category contributes to the growth of oppression. The following will examine each of these categories in further detail.

The first category of psychological oppression that Bartky addresses is

stereotyping. Stereotyping reflects a conventional or standardized idea or image that often lacks originality or truth. [40] These ideas or images emphasize a person's physical or psychological attributes in a negative and condescending manner. Typically, these ideas or images are unwillingly placed upon people, causing harm to individuals who comprise today's society. Stereotyping contributes to diminished self-esteem, the internalization of inferiority, and the racial, economic, and political oppression of those being stereotyped. Bartky examines two forms of stereotyping: racial and sexual. Racial stereotyping can be exemplified by the categorization of African-Americans in at least three ways. The first is to label African-Americans as less intelligent than members of the dominant culture's race. According to Bartky, African-Americans are viewed as childlike, intuitive, and spontaneous whereas members of the Caucasian race are rational, deliberate, and capable of substantial accomplishment. [41] An example depicting this racial stereotype was broadcast on national television in 1987. Ted Koppel, anchor for ABC Television's *Nightline*, interviewed Los Angeles Dodgers Manager Al Campanis regarding the status of African-Americans in major league baseball. When Koppel inquired as to why no African-Americans held general manager positions in baseball, Campanis responded by saying that African-American's have only "some of the necessities" to be a field manager or general manager. Campanis quickly qualified his response by saying that this did not hold true for all African-Americans. He continued by referring to the status of football quarterbacks and baseball pitchers at that time who were black, and how that number was quite small. He implied that African-Americans did not have the level of intelligence to hold positions that require decision-making skills or leadership roles in professional sports. Campanis added insult to injury by declaring that African-Americans are outstanding, god-gifted athletes—many are intelligent but have no desire to be in the offices of professional sports. These prejudicial, racist, and

stereotypical remarks led the Los Angeles Dodgers to fire Campanis within twenty-four hours of this national broadcast. A second way in which racial stereotyping can be exemplified is to label African-Americans as possessing greater sexual prowess than members of other races. This stereotype focuses predominantly on males. According to Bartky, it is thought that African-American's "are lustful and hotblooded; they . . . lack the capacities for instinctual control that distinguish [them] from animals." [42] A third way in which racial stereotyping can be exemplified is to perceive African-Americans as having greater athletic ability than members of other races. Some individuals continue to ignorantly profess that African-Americans have not evolved as fully as Caucasians have with respect to the evolution of mankind. These individuals depict African-Americans as more closely resembling that species which represented a raw depiction of both animal and man over three million years ago. This species eventually matured into a more specialized class—one whose physical characteristics more closely resembled man than animal. This species developed intellectual advantages such as larger brains and language. However, some individuals have erroneously concluded that African-Americans possess similar characteristics analogous to the earliest species of man. An example of this occurred in the 1980's when Jimmy "The Greek" Snyder was fired from CBS Television for purporting that blacks have superior muscular structures as compared to whites and thus, were better athletes. He believed that African-Americans more closely resembled animal than man, regardless of the evolution of mankind.

Sexual stereotyping, the second form of stereotyping, is exemplified by categorizing women as having less intelligence than men, or being incapable of achieving a higher level of intelligence than men. This presumption is sometimes based on the fact that virtually all higher level positions in numerous medical, legal, and academic organizations are held and dominated by men. One may erroneously conclude because of

this that women are inferior to men and are unequipped to master those high level positions currently held by men. If, and when women are given the opportunity to succeed, women may be negatively judged based upon their display of assertiveness or control in certain situations. Women are deemed "bitches", displaying atypical feminine traits more commonly associated with men. Men who are assertive, however, are deemed to be in control of a situation.

Sexual stereotyping is also exemplified in the categorizing of women as physically weaker than virtually all men. This physical weakness can lead others to believe that women are also intellectually weaker. This assumption is based on the fallacy of composition in which the conclusion of an argument depends on the erroneous transference of an attribute from the parts of something onto the whole. In this example, one cannot attribute a woman's physical weakness to her intellectual weakness. Too often society identifies and values peoples' accomplishments by virtue of their race, sex, or both. For example, when Sandra Day O'Connor was confirmed as a Supreme Court Justice, she did not simply become a Supreme Court Justice, but the first female Supreme Court Justice. Similarly, Sally Ride did not simply become an astronaut, but the first female astronaut. Carol Moseley-Braun's honor of being elected to the United States Senate in 1992 received more media exposure and attention than virtually every other newly elected senator because of her identification as both an African-American and a woman. The inclusion of both an African-American and a woman to Congress was both refreshing and welcome. These three examples reflect stereotyping because some individuals believed that these women earned their respective positions as a result of their gender, race, or capacity to fulfill a quota. In addition, upon the election or hiring of O'Connor, Ride, and Moseley-Braun, the women's physical attributes were more publicly emphasized rather than their achievements which may have been primarily due

to their acumen, tenacity, and commitment within their respective fields.

Bartky believes stereotyping is psychologically oppressive for two reasons. [43] The first reason is that those individuals who believe in the stereotypes will be unable to completely comprehend and respect the needs and rights of those individuals being stereotyped. The person who stereotypes will focus on aspects either irrelevant to, or negatively reflected by an individual's situation. There will be no consideration for caring about another's needs or rights. The second reason Bartky considers stereotyping to be psychologically oppressive is that if virtually all others believe the image that has stigmatized a particular individual, the individual stereotyped may begin to believe it as well. Whether or not barriers, such as oppressors, are eliminated in an individual's pursuit of a goal, stereotyping will continue to thwart their efforts at every turn if that individual does not believe in her or his actual capabilities. Even those individuals who are strong willed and confident in their abilities can eventually become convinced that they are inferior. This feeling of inferiority leads to self-abnegation. In order to withstand the consequences of stereotyping, society's negative conceptions of racial and sexual differences need to be changed. However, since generations of individuals have passed down generations of stereotypes, this transformation will be neither immediate nor simple.

The second category of psychological oppression that Bartky addresses is sexual objectification. According to Bartky, sexual objectification occurs when "[a woman's] sexual parts or sexual functions are separated out from the rest of her personality and reduced to the status of mere instruments or else regarded as if they were capable of representing her." [44] This objectification involves both the one who objectifies and the one who is objectified. Regarding sexuality, Sigmund Freud says:

> Visual impressions remain the most frequent pathway along which libidinal

> excitation is aroused; . . . it encourages the development of beauty in the sexual object. The progressive concealment of the body which goes along with civilization keeps sexual curiosity awake. This curiosity seeks to complete the sexual object by revealing its hidden parts. The eye is perhaps the zone most remote from the sexual object, but it is the one which, in the situation of wooing an object, is liable to be the most frequently stimulated by the particular quality of excitation whose cause . . . we can describe as beauty. (Freud pp. 22/75)

Often, a woman's sexual parts and sexual functions are the guideline of how well she measures up. This identification of women with their sexuality is oppressive because women are treated and viewed as sexual objects rather than as complete, thinking individuals who can contribute something other than libidinal excitation to society. Women are dominated and begin to believe that their sole function in life is sexual. Sexual objectification and oppression extend into every area of women's experiences. Women are regarded as having a tacit obligation to make the most of what they have. [45] In order for a woman to make the most of what she has, she is expected to accentuate her "finer" physical attributes: her makeup and hair as pretty and polished, her wardrobe as feminine and fashionable, and her personality as refined and reliant This tacit obligation presupposes that there is something unsuitable about the way a woman presents herself to the general public without first fixing herself up according to criteria set by men. A woman's cosmetics, hair, wardrobe, bodily movements and posture, hygiene, and weight have become the standards by which women are judged by our patriarchal culture. Bartky argues that the nature of feminine narcissism, or the infatuation with one's bodily being, imposes a significant burden upon women's lives. A woman is supposed to have a glowing complexion, fuller lips, and hypnotic eyes. According to Bartky, patriarchy presupposes that a woman's unpainted face is defective and that wearing make-up is like wearing a disguise. [46] Bartky's assessment seems accurate. One need only open a woman's magazine to find it laden from cover to cover with beauty, fashion, and exercise tips. These tips imply that there is something wrong with women. By simply following

these tips, women can transform themselves from beasts to beauties. These magazines also perpetuate the notion of the ideal woman as tall, waifish, made-up, beautiful and, as such, extremely desirable to men. It is no wonder that women continue to believe that these notions of beauty represent perfection in a woman and are what constitute their role as a woman in society. In advertising, as much as eighty percent of newspaper space and twenty percent of television time consists of advertisements whose purpose is to sell goods and services. These advertisements are selling an entire way of life. [47] Invariably that focus is on women. Bartky, following Simone de Beauvoir in *The Second Sex*, says that a woman knows " . . . that she is to be subjected to the cold appraisal of the male connoisseur and that her life prospects may depend on how she is seen . . . . " [48] Women then begin to appraise themselves against those standards perpetuated by women's magazines and by patriarchy. A woman sees herself as that "other" person in the position of judging her exterior and interior. Women perform this appraisal knowing that their goals or accomplishments may depend on this personal assessment. Bartky believes that " . . . women punish themselves too for the failure to conform. The depth of these women's shame is a measure of the extent to which all women have internalized patriarchal standards of bodily acceptability." [49] Bartky attributes the glorification of a woman's body and the opportunities for narcissistic indulgence to the fashion-beauty complex. She argues that the fashion-beauty complex surreptitiously aims to devalue a woman's body and estrange her from her own body. [50] The following summarizes Bartky's point:

> I must cream my body with a thousand creams, each designed to act against a different deficiency, oil it, pumice it, powder it, shave it, pluck it, depilate it, deodorize it, ooze it into just the right foundation, reduce it overall through spartan dieting or else pump it up with silicon. I must try to resculpture it on the ideal through dozens of punishing exercises. If home measures fail, I must take it to the figure salon, or inevitably, for those who can afford it, the plastic surgeon. There is no "dead time" in my day during which I do not stand under the

> imperative to improve myself: While waiting for the bus, I am to suck the muscles of my abdomen in and up to lend them "tone"; while talking on the telephone I am bidden to describe circles in the air with my feet to slim down my ankles. All these things must be done prior to the application of make-up, an art which aims, once again, to hide a myriad of deficiencies. (Bartky p. 40)

Having worked in the retail industry for over six years, my experiences taught me that the highest volume selling area in retailing is cosmetics. One need only glance in virtually any department store to notice where the cosmetic department is located. It is typically given a prime location on the first floor near a key entrance. It is staffed to levels incomparable with selling centers housing merchandise ticketed at upwards of ten times the selling price of a tube of lipstick. Moreover, the cosmetic department staff must represent beauty to the consumer according to beauty industry standards. Layers of foundation, rouge, lipstick, eye shadow, mascara, nail enamel, and fragrance adorn each sales associate as she readies herself to offer women a way of transforming themselves from everyday to elegant.

Overall, being measured and judged only on one's physical attributes by those whose views have been shaped by patriarchy continues to reinforce the psychological oppression of women time and again. Different functions necessitate different capabilities. If a woman chooses to become a scientist, intellectual and scientific capabilities are more important in her attainment of this goal than her sense of fashion. If a woman chooses to become an educator, her scholarly capabilities are more important than the proportions of her body. However, if a woman chooses to become a model, then her physical attributes are more important than her scholarly capabilities in attaining her goal. To combat the perpetuation of sexual objectification, society must insist that women should not only be judged according to this standard of beauty. Society's conception of beauty should also be redefined so that individuals will perceive themselves and one another in a different, more positive manner. It is important that

women accept themselves for who they are and how they are without striving to imitate the notion of beauty found in the beauty and fashion industries. In addition, society must begin to hold those beliefs espoused by the fashion and beauty industry as incredulous. The cosmetic industry and advertising, along with their elaborate campaigns to create the consummate woman, must be viewed with ridicule and contempt in order to dispel these perpetually false notions.

The third category of psychological oppression that Bartky addresses is cultural domination. She defines culture as " . . . all the items in the general life of a people." [51] For Bartky, "[t]o claim that women are victims of cultural domination is to claim that all the items in the general life of our people—our language, our institutions, our art and literature, our popular culture—are sexist; that all, to a greater or less degree, manifest male supremacy." [52] Bartky believes that once women are oppressed, it makes " . . . the work of domination easier by breaking the spirit of the dominated and by rendering them incapable of understanding the nature of those agencies responsible for their subjugation." [53] One root of cultural domination is patriarchy. Patriarchy, according to Bartky, is the dominant male institution which has inflicted human damage upon women. Patriarchy continues to oppress women psychologically, as well as racially, politically, and economically. Patriarchal oppression can limit a woman's world. Bartky argues that "[u]nlike a colonized people, women have no memory of a "time before": a time before the masters came, a time before [women] were subjugated and ruled." [54] In *The Chalice And The Blade*, Riane Eisler believes that there was indeed a time before patriarchal domination in which males performed hunting and killing duties while women tended to social organization and nurturing. [55] Those actions performed by men or women were not considered a form of control or domination, but rather an acceptable way of living, Bonding between mothers and children was required if human offspring were to survive.

These scientists theorized that primitive tribes relied primarily on gathering, not on hunting. Also, the first tools created were not meant for killing, but for gathering and processing food, a task predominately performed by women. The view of man-the-hunter has since been replaced with both men and women utilizing their unique attributes and human faculties to support and enhance life. [56] Bartky argues with this view because although some measures have been taken to avert negative attributes associated with women, such as woman-the-gatherer or woman-the-nurturer, she believes they still are all too common today.

Bartky believes that the power psychological oppression has to dehumanize and depersonalize an individual is similar, in many ways, to the theory of alienation as described by Karl Marx. [57] Alienation is the process of the individual being separated or prohibited from those activities or objects which constitute one's self. Alienation of labor can occur when the work one performs is not the expression of a natural, creative need, but is motivated by the necessity of fulfilling others needs. Alienation of labor can also occur if the product one creates is for the profit of another, and is designed to fulfill desires of greed rather than true or virtuous human needs. Marx believed that labor was a distinct human activity that represented human ability and self-identification. Marx's theory divided capitalistic society into two major classes: the proletariat and the bourgeoisie. The proletariat, exploited for their labor, were utilized as means toward the bourgeoisie's ends of wealth, product, and power. The bourgeoisie's values and interests were reflected through their control of economic, political, and cultural institutions. Although the proletariat may have believed they were free in a capitalistic society, they were merely the "slaves" of the bourgeoisie and, as such, endured arduous physical labor with little satisfaction or reward. Alienation spread throughout the industrial working class. This alienation caused a fragmentation of the worker, that is, the loss of contact

and control of the products of her or his labor. Alienation also prevented people from fully exercising those capabilities and power deemed necessary for a full human existence. [58] Workers were alienated from the products of their labors, the forces of production, themselves, and their community. Through this alienation workers lost their freedom, doubted their self-worth, and were dehumanized by the bourgeoisie.

Overall, Bartky argues convincingly about the situations women face and endure as the result of stereotyping, sexual objectification, and cultural domination. Clearly, these all contribute to the psychological oppression of women. The oppression of women is relevant to science because oppression effects the methods by which science is performed, the extent of the involvement of women in science, and the different perspectives that women bring to science. In order to break the cycle of oppression of women by the dominant culture, science needs to be "reinvented" to include women and women's perspectives. The methods by which science is performed also need to be "reinvented". Justification of scientific agendas and research must be sought in empirically preferable results that can only be found in the lives of the oppressed. Moreover, based on Harding's views of science-as-usual and bad science noted earlier, it is clear that a science which describes, explains, and incorporates the experiences and insights of all genders, races, and cultures in the natural and social worlds is needed. For Harding, that science would be considered a good science.

A good science would propose scientific agendas, research and gather data on all genders, races, and cultures, and eliminate social biases. It would reevaluate inadequate and oppressive models of women's health and behavior. In addition, a good science would incorporate many insights from feminism. This good science would also reconceptualize the methods, theories, and goals of science to prevent the exploitation and oppression of races, genders, and classes outside the dominant class. Ultimately, this

good science would be the same for men as it is for women. Harding, following Anne Fausto-Sterling in *Myths Of Gender*, says that " . . . although [the revisions that feminist have called for] may represent good science, [these revisions] arose in the context of a vast and multiply branched political-cultural movement, that of modern Western feminism." [59] Harding also believes " . . . there is a real danger that good science will not happen if we do not recognize the role of political change in the advance of knowledge." [60] For Harding, feminist science, which recognizes that different people have different experiences, cultures, and identifications, and thus different perspectives, values, and goals is a good science. Following Ruth Bleier in *Feminist Approaches to Science*, Harding says that " . . . feminist approaches to science would 'aim to eliminate research that leads to the exploitation and destruction of nature, the destruction of the human race and other species, and that justifies the oppression of people because of race, gender, class, sexuality, or nationality.'" [61] Feminist science would be accessible to all who are interested in it. Harding believes that cultural diversity among feminist science participants would help increase the " . . . sensitivity of the scientific community to the range of consequences of its work and thus its responsibility for the goals of science and the applications and by-products of its research." [62] But these transformations cannot occur until scientists reconceptualize the methods, theories, and goals of science. More importantly, these changes need to occur without input from those who have long controlled science in order to support and reinforce its aims. Following Anne Fausto-Sterling in *Myths of Gender*, Harding says that " . . . feminists—most but not all of whom are women . . . have waged intense battles for the opportunity to do scientific work in the first place. Their very status as outsiders—women and feminists in a masculine scientific world—has lent them a vision which quite appropriately claims the label of feminist." [63] Overall, these changes will not occur until the influence of the dominant class diminishes

in directing scientific agendas and scientific research. In order to raise the level of science for women to the level it has been for the dominant class of men, many past inequities need to be corrected. Overall, opportunities for women in science—from practicing it to being the surveyed subject—have considerably lagged behind those opportunities for men. It is important that good science undo historic trends of discriminating against women. This means that more attention must be placed on offering additional opportunities, funding, and advancement in scientific studies to women over that of men to help narrow and eventually close the gap that exists. Past disparities between women and men must cease to exist in the sciences. If the scientific community is to achieve a good science, it must bring the current level of science as studied and practiced by women to the same level it has always been for white, western males. Once that level is attained, science must go forward, striving to be impartial and fair towards all human beings.

For Harding, science based on the experiences of white, western males is partial and distorted. Harding does not believe that the perspectives and practices of other groups must somehow be integrated into one's own perspectives and practices. Instead, she holds that those practices and beliefs which remain unquestioned need to be examined in light of the perspectives and practices of other groups. A less partial, less distorted science holds that scientific views and beliefs encompass the concerns, desires, needs, and wants of those people affected by them, and not simply the dominant class. It incorporates the experiences and insights of all genders, races, and cultures in the natural and social world. Clearly, beliefs by bigots and other ideologically dogmatic groups are less desirable in developing a less partial, less distorted science because their beliefs are often based on ignorance and intolerance. It may, however, be virtually impossible to exclude these dogmatic groups from any new development of science because whether or

not their beliefs are desirable by the majority of human beings, the goal of a less partial, less distorted science is to incorporate the beliefs of those individuals affected by them. Feminist standpoint theorists argue that science-as-usual reflects experiences of white, western males in the elite class. In order to develop a less partial, less distorted science, scientists must begin researching women's lives so the scientists can arrive at empirically and theoretically more adequate descriptions and explanations. [64] The feminist movement calls for the need to develop sciences and technologies that are for women in every race, class, and culture. These sciences and technologies should not only be for women, but for human beings of all races, classes, and cultures. Feminists want to close the gender gap that exists in current sciences and technologies, thus enabling women to obtain more control over the condition of their lives. One obstacle that exists for women in allowing them to control the condition of their lives is the powerful institutions that have little interest in developing social relations within the sciences beneficial to anyone but those in the dominant groups. [65]

Is a less partial, less distorted science as good as it gets? I believe that a less partial and less distorted science can be improved even further. Scientists seem to be influenced—consciously or unconsciously—by the political needs and priorities of their society. In this case, it would be difficult to regard science as being less partial and less distorted. This does not mean that the actual processes of doing science are unscientific or do not generate reliable, empirical information about the subject being studied. Rather, it means that what initiated the scientific process was based on political need. Individuals should not place blame solely on the scientists who process and produce scientific information, but instead should challenge the policy makers who are ultimately responsible for what kinds of research will be conducted, who will receive funding, and how the sciences and technologies will be utilized. If and when scientific research can

get beyond the political arena, a less partial, less distorted science can prevail as long as scientists—especially male—consider, research, and implement new empirical evidence derived from all genders, races, and cultures.

In order to justify the empirically preferable results of research that has been led by the politics of the women's movement, Harding reports on two of the most developed theories of scientific knowledge that have emerged from feminist research in the sciences—feminist empiricism and feminist standpoint epistemology. To begin with, let me examine the theory of feminist empiricism. According to Harding, feminist empiricism is an epistemological strategy for justifying the challenges to traditional assumptions. Feminist empiricism emphasizes the importance of the women's political movement by making virtually everyone aware of how the world around us has been distorted by social blinders that have obscured knowledge and observation. [66] Because of the women's movement, preferable conditions have been created that make better science possible. Feminism can be viewed as a political movement not only for the emancipation of women, but also for social change. Moreover, the women's movement, led by women and feminist researchers, is more likely to notice androcentric biases that exist in the sciences and social values, and to produce unbiased and objective results than are men. [67] For Harding, feminist empiricism argues that sexism and androcentrism are social biases correctable by stricter adherence to existing methodological norms of scientific inquiry. Harding believes " . . . it is easier to gain acceptance of feminist claims through [feminist empiricism], for it identifies only bad science as the problem, not science-as-usual." [68] Bad science occurs when prejudices and social biases, introduced and incorporated by scientists in research, produce sexist and androcentric claims. Harding believes that " . . . prejudices are created by hostile attitudes and by false beliefs that are due to superstition, ignorance, or miseducation but have often become

entrenched in custom [and law]." [69] These biases are prevalent not only when scientific problems are being identified and defined, but also during the research process and in the collection and interpretation of data.

According to Harding, there are several conservative strengths that emerge from feminist empiricism. She considers these strengths to be conservative because they are thought to be less threatening to the practices of the sciences and to their epistemologies than feminist standpoint epistemology strategies. The first is that scientific research emerging from feminist research better meets the standards of good science because this research supersedes previously gender-blind studies. That is, many of the claims stemming from feminist research in the social sciences offer better empirical support than the claims they replace. Harding does not mean to imply that feminist claims should automatically be preferred over all other claims simply because they are feminist. Rather, when the results of such scientific research reflect strong empirical support, the fact that they were produced through politically guided research should not hinder the results. [70] Often, after research has been conducted, and findings have been established and reported, individuals can see, understand, and interpret things they could not before, while some individuals can see them more clearly than others. As Harding notes, "[w]hat we can see in the world around us is a function not just of what is there plus our individual talents and skills but of how our society designs the cultural filters through which we observe the world around and within us and how it institutionalizes those filters in ways that leave them invisible to individuals." [71]

The second strength of feminist empiricism is its challenge of incomplete methods in which science has been practiced. It does not, however, challenge the norms of science itself; thus, it leaves much of scientists' traditional understanding of the principles of adequate scientific research intact. The social values and political agendas

of feminism tend to raise issues that reveal the need for a larger scope of inquiry and greater care in the conduct of inquiry. For Harding, " . . . [t]he point of a theory of knowledge is not that it be correct by some unfamiliar standard that most people don't accept but that it be persuasive to reasonable, thoughtful, and informed listeners." [72]

The problem with this particular strength of feminist empiricism is that it suggests that feminist empiricists do not challenge the norms of science. However, some of these norms are precisely what contribute to androcentric results in research. Since the norms were developed with the intention of answering those questions an androcentric society has about nature and social values, it seems futile to uphold those same norms. As Harding says:

> A reliable picture of women's worlds and of social relations between the sexes often requires alternative approaches to inquiry that challenge traditional research habits. It is not only that the underlying general principles of scientific method are not powerful enough to detect culturewide sexist and androcentric biases but also that the particular methods and norms of the special sciences are themselves sexist and androcentric. (Whose Science p. 117)

Thus, to keep intact the norms of science which are based on the lives of the dominant status of white, western males would not aid the feminist movement in ameliorating the situation of women in science.

The third strength of feminist empiricism is its conservative justificatory nature. "The social structure of the sciences remains hostile to women scientists, especially to researchers engaged in learning more about women and gender in ways directed by antisexist assumptions," claims Harding. [73] This justificatory nature allows for scientists to manage and maintain the required respect necessary for continued funding, teaching, and laboratory appointments to those inquiries geared more towards feminist scientific studies.

The problem with this strength is that it calls for a pretense in the directing of

studies and funding towards strengthening feminist scientific studies. This pretense hides the true justifications for wanting to proceed with these studies. It places the concerns of those researchers opposed to learning about feminist scientific studies above those researchers trying to learn and examine the same information about feminist scientific studies. This shroud of secrecy may lend itself to increased antagonism and ridicule by those opponents of the feminist movement. To advance feminist scientific studies under such conservative, almost clandestine methods will have to be used to minimize its ultimate purpose—that is, to demonstrate the effectiveness, usefulness, and applicability of feminist scientific studies.

The last strength of feminist empiricism is its appeal to how the history of science developed. Harding notes that it was the bourgeois revolution of the fifteenth to seventeenth centuries—the movement from feudalism to modernity—that made it possible for modern science to emerge and help clarify earlier knowledge and observations. During the proletarian revolution of the late nineteenth century, people began to understand the effects of class struggles on social relations. Positive effects on the growth of scientific knowledge were also established during the post-1960 decline of North Atlantic colonialism. Similarly, the contemporary women's movement is the most recent of these revolutions which move society closer to the goals of the creators of modern science. [74] Harding points out that it is movements for social liberation like these that have most increased the objectivity of science, not the norms of science as they have been practiced. She defines conventional objectivity as a value-free, dispassionate notion in which one cannot separate justified beliefs from mere opinions, or real knowledge from mere claims to knowledge. [75] While Harding feels that appealing to the development of the history of science is useful and practical in the face of adversity, it is presumptuous to assume because other revolutions' arduous battles succeeded in

achieving their goal that this movement will also succeed. She is making a prediction about the women's movement revolution based upon her examination of past revolutions. Although her argument from analogy is relatively strong because she compares several events with great similarity, these similarities are not completely identical. Hence, there is a strong probability that at some point, the analogy will break down. Therefore, no such guarantee exists that the women's movement revolution will follow the same pattern of success as past revolutions.

According to Harding, feminist empiricism appears to leave unchallenged the existing methodological norms of science. Harding says that feminist empiricism:

> [I]nsists that its methodological norms are meant to apply only to the "context of justification"—the testing of hypotheses and interpretation of evidence—not to the "context of discovery" where problems are identified and defined. Thus a powerful source of social bias appears completely to escape the control of science's methodological norms. Finally, it appears that following the norms of inquiry is exactly what often results in androcentric results. (Science Question pp. 25-26)

As is evident, feminist empiricism is not without its flaws. Another developed theory of scientific knowledge that has emerged from the reflection of feminist research in the natural and social sciences on how to justify the results of feminist research can be found in feminist standpoint epistemology. Feminist standpoint epistemology attempts to construct knowledge from the perspective of women's lives. Harding points out that individuals must begin to accept the idea that all knowing will incorporate the standpoint or social and historical perspective of individual knowers. Harding says:

> [E]ven if researchers were to follow the most rigorous rules of traditional methods of research, they would not be able to achieve strong objectivity. This is because these methods . . . neglect to identify the social desires, interests, and values that have shaped the sciences. Science presents itself as subjectless: the disembodied report of value-free, context-independent facts . . . . [However] . . . [s]cience does have a subject, which in our community is a group of dominant males, and that this subject has a standpoint, that is, a perspective involving assumptions and values based on the kinds of activities this group engages in.

> Traditional science leaves this standpoint unexamined and thus impoverishes the objectivity that science could achieve . . . . (Alcoff pp. 5-6)

Harding advocates a methodology that begins with thoughts from the lives of marginalized individuals. Marginalized individuals are those human beings outside the dominant culture whose lives are devalued and neglected. These marginalized individuals' ideas, beliefs, values, and standpoints are typically excluded from the establishment of scientific knowledge. Since feminist standpoint theorists believe that knowledge is supposed to be based on experience, feminist claims are scientifically preferable because they originate in, and are tested against, a more complete and less distorting kind of social experience, that is, the experiences arising from the activities of women. [76] These features in women's activities are more prevalent in women's situations and are utilized in feminist research to develop more accurate descriptions and explanations, both empirically and theoretically better than conventional research. Harding acknowledges that " . . . [f]eminist standpoint theories focus on gender differences, on differences between women's and men's situations which give a scientific advantage to those who can make use of the differences." [77] She also notes that, unlike feminist empiricism which emphasizes the continuities between conventional justifications of scientific research and feminist research, feminist standpoint epistemology emphasizes the continuities between broad social formations and characteristic patterns of beliefs. [78] Harding discusses eight differences in the situations of women and men, all of which suggest numerous and different grounds upon which feminist standpoint theory rests.

First, Harding believes that because women's lives are different from men's, women's lives have been " . . . erroneously devalued and neglected as starting points for scientific research and as the generators of evidence for or against knowledge claims." [79] Because women and men have different types of roles and activities assigned to them by

society, they have led significantly different lives. Dominant knowledge claims, which are based on the experiences and knowledge of white, western males, can be eradicated of their partialities and distortions when one utilizes women's lives to criticize those knowledge claims. Simply because women and men exhibit differences, one should not presume that any of those differences are a reflection of a woman's inferiority. For Harding, "[t]he goal of maximizing the objectivity of research [that is, integrating the origins, practices, social values, interests, and good and bad beliefs of all genders, races, and cultures] should require overcoming excessive reliance on distinctively masculine lives and making use also of women's lives as origins for scientific problematics, sources of scientific evidence, and checks against the validity of knowledge claims." [80] She does not say that simply because feminist standpoint theories are knowledge claims grounded in women's experiences that those claims provide reliable ground for knowledge claims about all nature and social relations. Rather, what Harding is saying is that while women's experiences and what women say are good places to begin research in the social sciences, as well as to provide grounds for feminist claims, they are not reliable grounds for deciding precisely which claims to knowledge are preferable. One way to establish these claims to knowledge is through democratic and participatory politics. Otherwise, for Harding, " . . . only the gender, race, sexuality, and class elites who now predominate in institutions of knowledge-seeking will have the chance to decide how to start asking their research questions . . . It is important both to value women's experiences and speech and also to be able to specify carefully their exact role in the production of feminist knowledge." [81]

Second, Harding considers women to be valuable "strangers". Harding, following Patricia Hill Collins in *Learning From The Outsider Within*, suggests that people have a stronger tendency to reveal their innermost beliefs to a stranger than to others they know

better or are a part of a specific group or culture. Because of the input a stranger receives from other individuals, that stranger brings " . . . nearness and remoteness, concern and indifference . . . ." [82] Typically, strangers are remote and indifferent to other individuals. However, strangers can also be near and express concern for another individual when a mutual bond—even if only ephemeral—is formed. Alas, this bond can break as quickly as it began. Harding believes that since women are treated as strangers by the dominant class, women's exclusion provides an advantage to the social order because it explains how to view the social order from the perspective of an outsider. "The socially induced need for women always to consider "what men (or 'others') will think" leads to a larger gap between their observable behavior and speech and their thoughts and judgments," says Harding. [83]

For several reasons I agree that often an individual can express her or his thoughts, beliefs, and values more openly and readily to a complete stranger. One reason is that the stranger is hearing from this person for the first time, and is far removed from any background information or preconceived judgments about that person. Thus, the stranger is able to offer criticism which is not based solely on that person's background which they have just surmised from the conversation. Another reason is that often a person can reveal her or his innermost thoughts and feelings to a stranger because there is no fear of retribution from the stranger (barring any discussion of illegal acts). Rather, in the exchange between these two people, either individual can walk away from the dialogue with a renewed sense of hope or direction based on the discussion. Women can also be considered valuable strangers in the classroom. That is, while struggling to reveal their beliefs to a larger audience, women do, in fact, have beliefs and knowledge that are more readily revealed to strangers and smaller gatherings of individuals. One can readily observe in the classroom that fewer women raise their hand to speak forthright or to be

called on when a question is posed to the students than men. According to the American Association of University Women, males receive more attention than girls do in the classroom at all educational levels. [84] My experience at the college level is that women typically do not feel totally confident of the knowledge they possess regarding a particular subject and thus, how responsive or positive their audience may be to their comments. On the other hand, men seemingly raise their hand in class to answer direct questions or simply to offer commentary, regardless of their level of expertise or knowledge. Often, males have fewer inhibitions than women when it comes to expressing their thoughts and ideas extemporaneously.

The third basis for the superiority of starting research from women's lives rather than from men in the dominant group is that "[w]omen's oppression gives them fewer interests in ignorance." [85] That is, since women are oppressed and exploited by dominant groups, women have fewer interests in ignorance existing within the social order. Thus, women have fewer reasons in wanting to maintain or justify the status quo than dominant groups. Since women have less to lose when they distance themselves from the social order, the perspective from their lives can generate new and discernible analyses. Once thinking and research originates from the perspective of oppressed people's lives, it is possible to observe aspects of the social order that were otherwise difficult to observe from the perspective of the oppressors' lives.

Fourth, Harding says that women's perspective from " . . . the lives of those who resist oppression generates less partial and distorted accounts of nature and social relations." [86] It is through their struggles that the oppressed wage against their oppressors that knowledge emerges. Having a women's perspective based solely upon women's lives offers a more complete description of social reality than simply accepting men's perspective. One may have a textbook example or theoretical explanation of a

specific phenomenon, yet not have knowledge of that phenomena until actually working with it, experiencing it firsthand, improving or changing it. As Harding says:

> In a socially stratified society the objectivity of the results of research is increased by political activism by and on behalf of oppressed, exploited, and dominated groups. Only through such struggles can we begin to see beneath the appearances created by an unjust social order to the reality of how this social order is in fact constructed and maintained. (Whose Science p. 127)

Harding stresses how women and men differ in their standpoints and perspectives by emphasizing the idea that one does not have to be a woman to be a feminist. Many men, having joined in the cause for women's struggles, are feminists. Not all men adopt the male point of view. Similarly, there are some women who have not fought against male supremacy.

Fifth, Harding believes that women's perspective is from everyday life. [87] Following Dorothy Smith in *The Everyday World As Problematic*, Harding notes that women's perspective from everyday activity is scientifically preferable to that of the ruling men in the dominant class. This is because women are assigned "women's work", thus relieving men of such perfunctory duties associated with "women's work" as child care and domestic work. This enables men to immerse themselves in matters unrelated to "women's work". [88] The more women continue to successfully perform "women's work", the more invisible this work becomes to men because it is not viewed as a real human activity. Men only view tasks that are self-chosen and consciously willed as suitable, real tasks. Women, therefore, become adept in performing "women's work", as well as performing duties typically dominated by patriarchy and, as such, are excluded from the dominant man's conceptions of culture and history. Following Bettina Aptheker in *Tapestries Of Life*, Harding endorses the interpretation of the "dailiness" of women's lives as the " . . . patterns women create and the meanings women invent each day and over time as a result of their labors and in the context of their subordinated status to

men." [89] This dailiness allows one to learn from the patterns women create and the meanings women invent. From this perspective, it is evident that traditional assumptions and social beliefs only serve to block one's ability to understand both women's lives and history. As such, women's perspective encompasses both women's work, as well as self-chosen tasks; thus, women are able to give a broader perspective of life's goings-on than are men.

The sixth basis for the superiority of starting research from women's lives rather than from men in the dominant group is that " . . . [w]omen's perspective comes from mediating ideological dualisms: nature versus culture." [90] In other words, women's work requires a production process that transforms natural objects into cultural ones, a process quite different from men's typical kinds of labor. Following Nancy Hartsock in *The Feminist Standpoint*, Harding says that women's labor involves them in a world where one's relationship with nature and human beings, both in the form of interaction with natural substances and in the form of close attention to the natural changes in these substances, is important. For Hartsock, "[w]omen's labor both for wages and even more in household production involves a unification of mind and body for the purpose of transforming natural substances into socially defined goods." [91] For example, a woman's experience of bearing and rearing children involves a unity of the mind and body. Women are adept at taking care of the children and family, domestic work, and social relations.

Seventh, Harding believes that women are outsiders within. [92] When women are in the position of being both at the margin and center of the dominant culture, it is possible for women to see the relationship that exists between dominant activities and beliefs, and those that arise on the outside. Harding, following Bell Hooks in *Feminist Theory: From Margin To Center*, says that when women observe themselves as the

outsider within, they can see which resources are available for reducing the partiality and distortion of research in addition to those available to researchers who restrict their work by studying outside the dominant culture. Harding, following Dorothy Smith in *The Everyday World As Problematic*, believes that " . . . objectivity is increased by thinking out of the gap between the lives of "outsiders" and the lives of "insiders" and their favored conceptual schemes." [93]

The last basis for the feminist claims that feminist standpoint epistemologies are less partial and less distorted is the appeal to how the history of science has developed. From feudalism to modernism, modern science emerged and helped clarify earlier knowledge claims and observation. An understanding of the effects of class struggles on social relations was gained during the proletarian revolution. Moreover, during the post-1960 decline of North Atlantic colonialism, positive effects on the growth of scientific knowledge were established. Similarly, the contemporary women's movement is simply the most recent of these revolutions which move society closer to the goals of the creators of modern science. [94] The myriad of changes created by the economy, the sexual revolution, increasing numbers of women in higher education, and civil rights struggles are only some of the examples that have led to changes in the gender system. Harding says the following:

> Looking at nature and social relations from the perspective of these conflicts in the sex/gender system—in our lives and in other women's lives—has enabled feminist researchers to provide empirically and theoretically better accounts than can be generated from the perspective of the dominant ideology, which cannot see these conflicts and contradictions as clues to the possibility of better explanations of nature and social life. (Whose Science p. 133)

Harding's appeal to how history has handled revolutions can also be seen in our society's evolution for the concern of protecting and preserving the environment. In the 1970's, a majority of individuals perceived recycling as unnecessary and bothersome. Many

possessed little knowledge of the advantages of recycling. During the 1980's, minimal financial rewards were bestowed upon conscientious individuals who accumulated aluminum cans and glass bottles. Finally, in the 1990's, recycling has become virtually mandatory, with designated receptacles distributed throughout neighborhoods to accommodate all recyclable products. Little, if any, monetary gain is achieved. But now, I believe, citizens participate in the recycling effort because, over the course of the last twenty years, they have come to understand the virtues of recycling, as well as the consequences of not recycling. Change is inevitable. Typically, individuals fight against an issue in the present, but will come to accept it in the future, particularly if there is any benefit to them.

In assessing the benefits of feminist standpoint theory, Harding discusses several concepts. The first concept is objectivity. For Harding, the conventional definition of objectivity—sometimes referred to as objectivism—is " . . . a value-free, impartial, dispassionate [notion] that is supposed to guide scientific research and without which one cannot separate justified belief from mere opinion, or real knowledge from mere claims to knowledge." [95] According to Harding:

> Value-free objectivity requires also a faulty theory of the ideal agent—the subject—of science, knowledge, and history. It requires a notion of the self as a fortress that must be defended against polluting influences from its social surroundings. The self whose mind would perfectly reflect the world must create and constantly police the borders of a gulf, a no-man's-land, between himself as the subject and the object of his research, knowledge, or action . . . . Equally important, the notion of value-free objectivity is morally and politically regressive [because it] . . . has been used to legitimate and hold up as the highest ideal institutions and individuals that are, insofar as they are scientific, to be studiously unconcerned with the origins or consequences of their activities or with the values and interests that these activities advance. (Whose Science pp. 158-159)

Although the goal of objectivity is to identify all social values and eliminate them from research results, Harding believes objectivity is narrow and weak because it merely identifies and eliminates only those social values that differ from the researchers

conducting scientific research. [96] Moreover, Harding argues that objectivity should also be regarded as too broad because objectivists claim that all social values and interests are eliminated from the research process and its results. She does not believe that all social values have the same negative effects upon research results, in particular, those social values which are less partial and less distorted. [97] Some social values and interests have generated less partial, less distorted beliefs than others because they do not merely incorporate the values and interests of only the dominant culture. The goal of the objectivists seems impossible to attain because not all possible biases and social values can be eliminated from the research process and the results of research. I agree with Harding because she feels that only select values and interests harm research. To prevent negative values and interests from becoming a part of the research process can be a difficult task to achieve, particularly since modern science was constructed and has been reconstructed by a particular set of interests and values that are distinctively western, white, male, bourgeois, and patriarchal. [98] According to Harding:

> Objectivism results only in semi-science when it turns away from the task of critically identifying all those broad, historical social desires, interests, and values that have shaped the agendas, contents, and results of the sciences much as they shape the rest of human affairs. Objectivism encourages only a partial and distorted explanation of why the great moments in the history of the natural and social sciences have occurred. (Whose Science p. 143)

Weak objectivity allows the scientific community to be unconcerned with the origins or consequences of their practices, or with the social values and interests that these practices support. [99] Weak objectivity is very appealing to the dominant culture because it allows them to utilize science, research, and knowledge for their own needs and agendas while ignoring the needs of those outside the dominant class. Harding believes that weak objectivity " . . . offers hope that scientists and science institutions, themselves admittedly historically located, can produce claims that will be regarded as objectively valid without

their having to examine critically their own historical commitments, from which—intentionally or not—they actively construct their scientific research." [100] Harding claims that if standpoint theorists abandon objectivity, the alternative is to adopt relativism which is the " . . . assertion that what is thought to be a reasonable claim in one society or subculture is not thought to be so in another." [101] Many feminists object to the notion that feminist images or representations of the world have special epistemological or scientific status, and that this authority has been able to suppress the marginalized groups point of view. Feminist standpoint epistemologies call for the acknowledgment that all human and scientific beliefs are socially situated and that these beliefs generate the most objective knowledge claims. Harding asks whether the association of objectivity with socially situated knowledge is impossible. She believes that standpoint theory opens the way to stronger standards of objectivity. [102] As Harding says:

> The standpoint theorists have also criticized conventional sciences for their arrogance in assuming that they could tell one true story about a world that is out there, ready-made for their reporting, without listening to women's accounts or being aware that accounts of nature and social relations have been constructed within men's control of gender relations. (Whose Science p. 141)

Harding's goal is to achieve strong objectivity over those standards of conventional objectivity. Strong objectivity allows individuals to conduct a systematic examination of cultural agendas, assumptions, experiences, and beliefs made and include them as part of the evidence for scientific claims. These agendas and assumptions should not only identify good, true, or better confirmed beliefs but also bad, false, and less well confirmed beliefs. To achieve strong objectivity, it is important to value another individual's perspective and to investigate the relationship between human beings and their surroundings rather than to deny the existence of, or seek control over, this relationship. [103] Strong objectivity requires a commitment to acknowledge the historical character of every belief or set of beliefs. According to Harding strong objectivity also

requires " . . . putting the subject or agent of knowledge in the same critical, causal plane as the object of her or his inquiry. It permits us to see the scientific as well as the moral and political advantages of this way of trying to achieve a reciprocal relationship between the agent and object of knowledge." [104] Moreover, strong objectivity should not be defined as requiring or even desiring value-neutrality. [105] She believes that some individuals might feel that calling for strong objectivity is too idealistic and unrealistic. However, she questions whether it is more unrealistic than trying to explain the regularities of nature and its underlying causal tendencies scientifically without examining all their causes. Regardless of whether or not the ideal of identifying all the causes of human beliefs is achievable, Harding believes it should be held as a desirable standard. [106]

Another concept that Harding examines is reflexivity. Weak reflexivity is problematic because it requires one to identify the social cause of the best as well as the worst beliefs and behaviors of those individuals studied. The researcher must then also analyze her or his own beliefs and behaviors in conducting the research project. These beliefs and behaviors may have been shaped by the same kinds of social relations that the researchers are interested in identifying as causes of the beliefs and behaviors of other individuals. [107] The notion of strong reflexivity would necessitate that the objects of inquiry be conceptualized as gazing back, and that the researcher, through theory and methods, stand behind them, gazing back at her or his own socially situated project in its relationship to other projects of her or his culture—many of which can be seen only from locations far away from the scientist's actual daily work. [108] For Harding, strong reflexivity requires " . . . the development of oppositional theory from the perspective of the lives of [other people], since intuitive experience . . . is frequently not a reliable guide to the regularities of nature and social life and their underlying causal tendencies." [109]

As noted earlier, Harding acknowledges that feminist standpoint theories focus on gender differences between women's and men's situations. In addition, feminist standpoint epistemology attempts to construct knowledge from the perspective of women's lives. These theories, in conjunction with feminist science which recognizes that different people have different experiences, values, and perspectives call for the following two determinations: how knowledge of other individuals, particularly women, can be incorporated into the sciences, and how knowledge is defined and from which sources knowledge may be considered valuable. To begin with, I will examine how the knowledge of women can be incorporated into the sciences. In *Marginality And Epistemic Privilege*, Bat-Ami Bar On examines the concept of epistemic privilege which is when certain individuals " . . . located at the social margins have an epistemic advantage over those located in the social center." [110] An individual is considered to be socially marginalized when that individual exists outside of the dominant culture. It is the dominant culture who makes policies and engages in social practices that shape everyone's lives. However, the lives and experiences of the socially marginalized are not considered by the dominant culture. Bar On emphasizes that members of the most decentered group can be epistemically privileged. Those individuals located at the social margins have the ability to observe the events—both positive and negative—within the epistemic stance of the dominant group. Bar On believes that decentered groups have the ability to avoid being rendered powerless by the dominant culture. Power, or the control an individual or institution has over other individuals, ideas, or the natural world can exist among multiple centers, in other words, when more than one epistemically privileged group maintains control over socially marginalized groups. These epistemically privileged groups sometimes share similar qualities, including race, sex, or gender. It is virtually impossible to have one clear cut centered group that does not share

similar attributes with another group. An example would be that in a centered group consisting of women, other secondary groups of women would exist such as African-American women or Hispanic women. In this respect, it is difficult to attribute epistemic privilege to just one group living in one society. Having epistemic privilege has given socially marginalized people the opportunity to empower movements in important ways. For example, if a socially marginalized group has epistemic privilege, they justify their position of authority they would not normally have by utilizing their own practices and ideologies, and demanding that their voices be heard and be given respectful attention by others. [11]

It is also possible that those individuals who are typically members of the dominant group can also be considered epistemically privileged. This dominant group has the ability to enforce their epistemic views upon decentered groups. Decentering occurs when an epistemically privileged group is dominant over other groups because of the former's economic, social, or political power. The dominant group does not recognize the socially marginalized groups' beliefs as legitimate or able to affect the dominant group. What results is that socially marginalized groups, for example, African-Americans, Hispanics, or lesbians are pushed out of mainstream society and become decentered. The centered groups are the epistemically privileged groups whose views are validated and are taken seriously. The epistemically privileged see little need, value, or impact in investigating and learning about decentered groups as they relate to their own lives. An example can be seen in a highway development project. Those individuals who support the development project, either for its merit or financial impact, will implement virtually any and all means to develop the highway, even if it necessitates displacing families and their homes who live in the direct path of the new development. The supporters of this project have little to no regard for the decentered groups' needs,

concerns, or welfare.

Now, after reviewing how knowledge of other individuals, particularly women, can be incorporated into the sciences, I will begin to examine how knowledge is defined and from which sources knowledge may be considered valuable. Patriarchal domination, as discussed by Vrinda Dalmiya and Linda Alcoff in *"Are "Old Wives' Tales Justified?"*, describes the phenomena of epistemic discrimination typically utilized against women. Dalmiya and Alcoff characterize epistemic discrimination as information that is not considered knowledge because it lacks specific requirements needed for justification. Traditionally, women's beliefs fall short of meeting those specific requirements because of where the information is derived or the status that information has been given. [112] Epistemic discrimination can be illustrated by contrasting male knowledge versus female knowledge. According to Dalmiya and Alcoff, male knowledge is propositional knowledge, or "knowledge that". This means that male knowledge is a network of statements, systems of theories, and collected and tested data that has been proven as genuine knowledge. Propositional knowledge excludes experiential knowledge, which is knowledge gained by the process of personally encountering or undergoing an experience instead of through books or established facts. In contrast, Dalmiya and Alcoff say that female knowledge is practical knowledge, knowledge in which one learns " . . . from practice and "hearsay" rather than through "authoritative" books that collected "facts" and stated them in the form of propositions." [113] Propositional knowledge is held with much higher regard than practical knowledge. Dalmiya and Alcoff challenge the claim that practical knowledge is not genuine knowledge. In a manner similar to Lorraine Code's *"Taking Subjectivity Into Account"*, [114] Dalmiya and Alcoff believe that practical knowledge has its place within an epistemology of everyday lives. Code argues that knowledge in the form of "*S* knows that *p*" is by no means representative of human

knowledge or knowledge in general. [115] *S* represents an individual knower and *p* stands for a proposition. Simply because propositional knowledge falls into the form of "*S* knows that *p*" and practical knowledge does not should not mean that practical knowledge is unworthy of merit. Code believes that because science and technology have been so successful, it is no wonder that scientific methods appear to offer the best available route to reliable knowledge. Code rejects the idea that simply because information has been "scientifically proven" that it carries an immediate presumption of truth with it. [116] Dalmiya and Alcoff strongly believe that the epistemological reason for women's knowledge claims being undermined is that women's knowledge claims ignore the modern epistemic schema in which all cases of knowing are formulated in terms of "*S* knows that *p*". Dalmiya and Alcoff utilize the history of midwifery in the Western World to illustrate that there is an almost exclusive preference for propositional knowledge. Because a midwife had knowledge and childbearing skills, she was a respected member of the community. Her practical knowledge was derived from direct personal experience of childbirth, sharing of stories and information, and conducting training classes. Practical knowledge was not considered genuine knowledge because it did not fit into the schema of "*S* knows that *p*". Traditional women's knowledge claims are epistemically discriminated against based upon their origins and, as such, are not considered propositional knowledge. [117] It does not fit within the modern epistemic schema of "*S* knows that *p*". In a male dominated society, there is an exclusive preference for propositional knowledge because it follows a specific methodology that derives facts or truths stated in the form of propositions and are then included in "authoritative" books. In Dalmiya and Alcoff's midwifery example, comparing a midwife to a male physician is considered fatuous because although each has similar childbearing techniques, their source of knowledge is different. Once again, a midwife's knowledge is derived from

hearsay which, according to male-dominated epistemology, cannot be substantiated. A physician's knowledge is derived from facts and is stated in the form of propositions. Hence, the midwife's knowledge is held in lower regard than the male physician's. Simply because a midwife knows how to deliver a baby does not mean she has propositional knowledge. Because of her lack of propositional knowledge, a midwife would not be viewed as an expert or even knowledgeable in childbearing. This exclusion of her experience and practical knowledge lies at the root of epistemic discrimination. Traditional women's beliefs have generally not met the requirements of propositional knowledge ("*S* knows that *p*"). In order to meet these requirements, knowledge must be derived from facts that have been proven and documented. Dalmiya and Alcoff argue that there are genuine types of women's knowledge that cannot be forced into the "*S* knows that *p*" schema. This should not mean, however, that women's knowledge cannot be considered a genuine form of knowledge. Since members of patriarchal society regard women's knowledge as primarily practical versus propositional, women have been stigmatized with references of ignorance, uneducated, and superstitious. [118]

I wholeheartedly agree with Dalmiya and Alcoff. Since epistemology is the branch of philosophy that investigates the origin, methods, and limits of human knowledge, it must incorporate all accounts of knowing and knowledge. This knowledge should include knowledge derived from experiences as well as from "factual", propositional knowledge. It must also include knowledge derived from females as well as from males. One must challenge the notion of how information or knowledge becomes propositional knowledge. Instances of observation, experience, or practice can provide the basis for knowledge beginning in its rawest form. From these stages, hypotheses and data are formulated, researched, and tested. What ultimately results is what Dalmiya and Alcoff refer to as propositional knowledge. Clearly, a "fact" does not

simply come into existence, but is derived through a series of processes that begin from experience, observation, or practice. The process of establishing information as a fact considers many different perspectives from different individuals and different cultures that may be beyond the reach of traditional forms of knowing, since one can obtain knowledge from many different sources—the laboratories, the streets, the classroom, and even from the birthing room—virtually anywhere. [119]

One issue that can arise from the discussion of epistemic discrimination is whether or not women and men really have different ways of knowing. I believe women and men do have different ways of knowing because of how they were raised, nurtured, and influenced. If two people, regardless of their gender, race, or culture were to witness the occurrence of the same event, it is highly probable that each individual would interpret the event in her or his own unique way. What constitutes one event as being the same as another event is that the physical movements or transactions of either individuals, objects, or nature occur at any one given moment in time. These movements or occurrences are uninterpreted at this point. Once they are viewed by a human being, however, her or his perspective and interpretation of the event may alter her or his description or explanation of the event. Individuals will view the event through her or his own perspective, regardless of the fact that each viewed the exact same event. Each person's testimony or interpretation as a witness to the event will differ, even if only slightly. The reason why two individuals will perceive the same event differently is because of how these individuals were nurtured and socialized throughout their lives. Those beliefs, values, and ideas instilled in individuals by parents, peers, and the educational system will determine her or his point of view. It is similar to how one's exposure and experiences from being raised on a farm in the country versus growing up in an apartment in the city would lend itself to different points of view. Oppression can

also cause individuals to have different ways of knowing and different points of view. Oppressed women will have a different perspective than other individuals because of the domination that patriarchy has inflicted upon them. Patriarchy chooses to exclude oppressed women from virtually all aspects of life. Women, therefore, do not have the knowledge or understanding of particular goings-on. Women's knowledge has also been based on how patriarchy chooses to have women view the world or certain situations. That is, a woman's knowledge can only be as broad as what she is exposed to or taught. Patriarchy chooses to expose women to very little, or that which suits the dominant culture.

I do not subscribe to the idea that a women's way of knowing is inferior to a man's way of knowing. Simply because two perspectives or theories of knowledge are different, it does not necessarily follow that one is superior to the other. It also does not mean that the knowledge held by the person in the dominant class should, in any way, be considered more valuable or pertinent than the knowledge held by the person in the oppressed class. Differences such as personalities, beliefs, or performances deemed as weak versus strong, passive versus dominant, or wrong versus right must not be considered a sign of inferiority in either sex. When these differences are ignored, science will continue to predicate its findings based on a minority of people rather than the majority. As Harding recognizes, in excluding socially marginalized people from all facets of science, the dominant culture continues to be ignorant of the differences and the causes of those differences among individuals. This goes against Harding's philosophy of strong objectivity. If patriarchy persists, the dominant culture will continue to inculcate their views and knowledge onto the rest of society, achieving those goals that suit their agendas. Because of oppression, women continue to succumb to patriarchy. To halt the progression of bad science and to achieve a less partial and less distorted science, it is

important that women, minorities, and other individuals outside the dominant culture strive to become active members of the scientific community. Once those outside the dominant culture become active members of the scientific community, they will be able to affect the agendas and applications of scientific studies and will be able to include themselves as important subjects to be studied because their problems and concerns will be considered viable.

Since women and men have different ways of knowing, it is inevitable that women and men will have different approaches to science. Again, this does not presume that one approach is superior to the other. Rather, the two approaches allow each gender to bring a fresh, albeit different perspective to the scientific table. This will help in achieving Harding's goal of a less partial, less distorted science. According to Holloway, often times "[s]tudies of men and women interacting in groups suggest that women are interrupted more frequently, that their contributions are more often attributed to men in the group and that they are less comfortable with antagonistic discussions." [120] Furthermore, " . . . women are being judged by men in a system set up by men that basically reflects [men's] standards and criteria . . . Some of that has not to do with excellence in science but with style." [121] It is evident that there are a myriad of individual styles doing science, whether one compares men's styles to men's styles, or women's styles to women's styles. The differences in style are not limited to comparing women to men. For example, during the last few years, women's health has received more attention and funding due in large part to the increasing number of women researchers and practitioners in science. For a long time, conclusions derived from studies on only male patients were being applied to female and minority patients. Studies in the *New England Journal of Medicine* show that female patients who have female physicians are twice as likely to receive pap smears and mammograms than are

female patients who have male physicians. [122] In addition, studies conducted at the Yale School of Medicine regarding heart problems show that men who experience feelings of hostility and pressure are at a higher risk for fatal recurrent heart attacks. For women, these same experiences create the opposite risk. The highest risk for fatal recurrent heart attacks for women occurs when women suppress emotions, including anger, and have a low sense of urgency. [123] Since heart disease studies rarely focused on women, it was assumed that studies and findings conducted about men could automatically be applied to women. Apparently, this is not the case. Since women and men have different ways of knowing, they too will have different ways of approaching and performing science.

Overall, the oppression of women relates to science in many ways. To firmly establish grounds for a less partial, less distorted science, scientific agendas, data, and research must incorporate information regarding all genders, races, and cultures. Also, social biases and discrimination need to be eliminated. It will be very difficult to achieve these goals if the oppression of women is not eradicated. The dominant culture will continue to regard their problems and views of the world as everyone else's, including women's. Thus, bad science will not be eradicated. Since patriarchy has no regard for the conditions, thoughts, and lives of women, there would be no reason for patriarchy to research or explain those issues that women find problematic. Moreover, women would be unable to even express those issues that they felt were problematic or pertinent to them. This will continue to weigh down heavily on a woman's psyche. For women to be told repeatedly that their thoughts and their existence are irrelevant will eventually lead women to believe it themselves—as if they were their own oppressors. From infancy to adolescence to adulthood, females and males are nurtured and socialized differently, with the result being that gender-specific roles are established in society. Individuals and institutions perpetuate these roles, often at the expense of women's lives and freedom.

Based on the culmination of their lives, individuals will offer different perspectives relative to their personal experiences, opinions, and biases. Patriarchy psychologically oppresses women through racial and sexual stereotyping, sexual objectification, and cultural domination. These stigmatize women, continually breaking down any amount of self-esteem women may possess. Under these conditions, women will not be able to overcome the heavy burdens of patriarchy in order to develop a less partial, less distorted science. Patriarchy will continue to adhere to the practices of bad science because female knowledge as opposed to male knowledge is held with contempt. However, based on Harding's findings, although women were not then at the forefront of science, women have demonstrated their capabilities in different fields as equal to or superior to men. This serves to demonstrate that women in the sciences who performed in subordinate capacities relative to their male counterparts have the background, intelligence, and perseverance to preclude themselves from further omission in the field of science. Although the relative number of women in the forefront of their respective fields in low, this number will continue to increase. Women must unencumber their minds in order to make the task of domination more difficult for the dominant culture. Collectively, women must spearhead their causes for equality in science, epistemology, education, and society so that patriarchy can no longer have control over women. Women can then begin and continue to free themselves from an oppressive state. Overcoming one's reliance on distinctively masculine lives will improve women's lives and society as a whole. Moreover, science will become less partial and less distorted as it begins to focus on women and those individuals outside the dominant culture. In time, with education and determination, woman-the-gatherer may soon impinge on man-the-hunter and produce a less androcentric society.

ENDNOTES

[1] Sandra Harding, *The Science Question In Feminism* (Ithaca, New York: Cornell University Press, 1986) p. 9.

[2] Harding, *Science Question* p. 10.

[3] Harding, *Science Question* p. 10.

[4] Harding, *Science Question* p. 29.

[5] Sandra Harding, *Whose Science? Whose Knowledge: Thinking From Women's Lives* (Ithaca, New York: Cornell University Press, 1991) p. 54.

[6] Harding, *Science Question* p. 107.

[7] Harding, *Whose Science* p. 60.

[8] Harding, *Whose Science* p. 67.

[9] Harding, *Whose Science* p. 67.

[10] Harding, *Whose Science* p. 70.

[11] Harding, *Science Question* p. 107.

[12] Harding, *Science Question* p. 22.

[13] Harding, *Whose Science* p. 57.

[14] Sue V. Rosser, "Feminist Scholarship In The Sciences: Where Are We Now And When Can We Expect A Theoretical Breakthrough?," in *Feminism & Science*, edited by Nancy Tuana (Bloomington, Indiana: Indiana University Press, 1989) p. 7.

[15] Harding, *Whose Science* p. 61.

[16] Anne Fausto-Sterling, *Myths Of Gender: Biological Theories About Women And Men* (New York: Basic Books, 1985) p. 7.

[17] Fausto-Sterling pp. 13-14.

[18] Fausto-Sterling pp. 12-14.

[19] Fausto-Sterling p. 30.

[20] Fausto-Sterling p. 27.

[21] Fausto-Sterling p. 14.

[22] Fausto-Sterling p. 30.

[23] Fausto-Sterling pp. 35-36.

[24] Marguerite Holloway, "A Lab Of Her Own," Scientific American Nov. 1993: p. 96.

[25] Holloway p. 96.

[26] Fausto-Sterling p. 55.

[27] Harding, *Whose Science* pp. 28-29.

[28] Harding, *Whose Science* p. 93.

[29] Holloway p. 97.

[30] Holloway p. 97.

[31] Holloway p. 97.

[32] Holloway p. 97.

[33] Holloway p. 99.

[34] Holloway p. 100.

[35] Holloway p. 100.

[36] Holloway p. 99.

[37] Holloway p. 99.

[38] Harding, *Whose Science* p. 22.

[39] Sandra Lee Bartky, *Femininity And Domination: Studies In The Phenomenology Of Oppression* (New York: Routledge, 1990) p. 22.

[40] Bartky pp. 23-25.

[41] Bartky p. 23.

[42] Bartky p. 23.

[43] Bartky p. 24.

[44] Bartky p. 26.

[45] Bartky p. 29.

[46] Bartky p. 71.

[47] Michael Parenti, *Inventing Reality: The Politics Of The Mass Media* (New York: St. Martin's Press, 1986) p. 63.

[48] Bartky p. 38.

[49] Bartky pp. 76-77.

[50] Bartky pp. 39-40.

[51] Bartky p. 25.

[52] Bartky p. 25.

[53] Bartky p. 23.

[54] Bartky p. 25.

[55] Riane Eisler, *The Chalice And The Blade: Our History, Our Future* (San Francisco: Harper & Row, 1987) pp. 67-68. This alternative evolutionary model was proposed by scientists Nancy Tanner, Jane Lancaster, Lila Leibowitz, and Adrienne Zihlman.

[56] Eisler pp. 59-77.

[57] Bartky pp. 33-36. Bartky's interpretation of Marx's theory of alienation.

[58] Bartky p. 29.

[59] Harding, *Whose Science* p. 303.

[60] Harding, *Whose Science* p. 303.

[61] Harding, *Whose Science* p. 300.

[62] Harding, *Whose Science* p. 300.

[63] Harding, *Whose Science* pp. 300-303.

[64] Harding, *Whose Science* p. 48.

[65] Harding, *Whose Science* pp. 5-6.

[66] Harding, *Science Question* p. 10.

[67] Sandra Harding, "Feminism And Theories Of Scientific Knowledge," American Philosophical Association Newsletter On Feminism And Philosophy (November 1987): p. 10.

[68] Harding, *Science Question* p. 25.

[69] Harding, *Whose Science* p. 111.

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[115] Code p. 16.

[116] Code pp. 17-18.

[117] Dalmiya and Alcoff pp. 221-226.

[118] Dalmiya and Alcoff pp. 217-226.

[119] Dalmiya and Alcoff p. 241.

[120] Holloway p. 101.

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[123] Gannett News Service, "Buried Emotions Endanger Women," San Jose Mercury News 17 September 1993: p. A1.

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